

Attorney Docket No.  
COE-568

PATENT APPLICATION  
Serial No. 10/767,600

**AMENDMENTS TO THE CLAIMS**

1. (Currently Amended): A system for monitoring and alerting to change in media situated in an unenclosed natural environment adjacent a part of said system, comprising:

5 at least one array of parallel optical fibers, each said fiber of a different length one from the other and each said fiber incorporating an approximately right angle bend at its terminus in said media, said array affixed to an external surface of a support immersed in water and sediment in said unenclosed natural environment, said support having a length, width and depth, each optical fiber  
10 ~~having an end exposed approximately orthogonal to said media and said length of said support,~~

wherein said array communicates a pre-specified level of detail as data regarding said change, said level of detail permitting determination of at least the relative level of said water and said sediment about said support;

15 at least one source of optical signals in operable communication with each said optical fiber at least during a portion of operation of said system;  
at least one optical coupler in operable communication with each of said optical fibers; and  
at least one sub-system in operable communication with each said optical fiber  
20 at least during a portion of operation of said system,

wherein said data are processed by said sub-system to provide measurement of and alerting to said change, and

wherein said change may be recorded and displayed via said sub-system.

- 25 2. (Currently Amended): The system of claim 1 in which said data regarding said change is are selected from the group consisting of: reflection coefficients, transmission coefficients, and combinations thereof.

- 30 3. (Previously Amended): The system of claim 1 further comprising a multiplexer, wherein said multiplexer may be employed to energize said optical fibers in a pre-specified sequence.

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4. (Previously Amended): The system of claim 1 said optical fibers arranged in at least one vertical array upon a rigid support.

5 5. (Original): The system of claim 1 in which said optical fibers are plastic.

6. (Original): The system of claim 1 in which said optical fibers have an index of refraction of approximately 1.492.

10 7. (Original): The system of claim 1 in which said optical fibers are each incorporated as one of a pair in said optical coupler.

8. (Previously Amended): The system of claim 1 in which said sub-system includes at least an optical receiver, a high pass filter, an amplifier, a detector and a display.

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9. (Original): The system of claim 8 further comprising a control device.

10. (Previously Amended): The system of claim 1 in which said sub-system comprises at least a power meter.

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11. (Original): The system of claim 10 further comprising a processing and control device incorporating a display.

12. (Original): The system of claim 3 further comprising an umbilical cable in operable communication with at least said multiplexer, said source and said sub-system.

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13. (Original): The system of claim 1 further comprising an anchoring device.

14. (Original): The system of claim 1 in which said source is a light emitting diode (LED).

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15. (Original): The system of claim 14 in which said LED emits red light.

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16. (Previously Amended): The system of claim 1 in which at least one of said optical signals is provided as a cyclical signal.

5 17. (Original): The system of claim 16 in which said cyclical signal is a square wave.

18. (Original): The system of claim 17 in which said square wave is cycled at approximately three KHz.

10 19. (Previously Amended): The system of claim 8 in which said optical receiver is selected from the group consisting of a phototransistor, a photodiode, and combinations thereof.

20. (Original): The system of claim 1 in which said sub-system further comprises:  
at least one multi-channel multiplexed data acquisition printed circuit board  
15 incorporating at least one analog-to-digital converter;  
at least one personal computer, incorporating a display, in operable communication with said multi-channel multiplexed data acquisition printed circuit board; and  
software loadable on said personal computer for processing said data.

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21. (Original): The system of claim 1 in which said coupler is a four-port optical splitter.

22. (Currently Amended): A system for monitoring and alerting to change in media situated in an unenclosed natural environment, comprising:

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at least one optical means for sensing change in at least one characteristic of said media and transmitting data representing said change;  
at least one array of parallel said optical means, each said means of a different length one from the other and each said means incorporating an approximately right angle bend at its terminus in said media,

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wherein an end of each said optical means is affixed to an external surface of a support immersed in water and sediment in said unenclosed natural environment, said support having a length, width and depth, and

wherein said array communicates a pre-specified level of detail as data regarding said change, said level of detail permitting determination of at least the relative level of said water and said sediment about said support, and

~~wherein each said optical means is exposed approximately orthogonal to said media and said length, and~~

wherein said array communicates a pre-specified level of detail regarding said change, said level of detail permitting determination of at least the relative level of said water and said sediment about said support;

at least one means for energizing each said optical means, said means for energizing in operable communication with each said optical means;

at least one means for processing said data, said means for processing in operable communication with each said optical means,

wherein said means for processing provides measurement of and alerting to said change, and

wherein said means for processing displays and records said change; and

at least one means for coupling together said optical means, said means for energizing and said means for processing.

23. (Currently Amended): A method for monitoring and alerting to change in media situated in an unenclosed natural environment, comprising:

providing at least one array having at least one optical fiber, each said fiber of a different length one from the other and each said fiber incorporating an approximately right angle bend at its terminus in said media, said array affixed to an external surface of at least one support immersed in water and sediment in said unenclosed natural environment, said support having a length, width and depth;

~~exposing an end of each said optical fiber approximately orthogonal to said media and said length;~~

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configuring said array to provide a pre-specified level of detail regarding said change, said level of detail permitting determination of at least the relative level of said water and said sediment about said support;

5 impressing an optical signal from at least one source on each said optical fiber in said array;

collecting said impressed optical signal and a response signal of said media to said impressed optical signal;

10 providing a sub-system in operable communication with each said optical fiber, wherein said sub-system processes said response to enable measurement of and alerting to said change, and

wherein said sub-system displays and records said change; and

providing at least one coupler in operable communication with each said optical fiber, said source, and said sub-system.